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Table No: _____

Course: _____

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2015/2016

TSE2451/TSR2701 – SOFTWARE REQUIREMENTS ENGINEERING (All sections / Groups)

29 FEBRUARY 2016
2.30 p.m. – 4.30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 7 pages with 4 Sections only.
2. Attempt **ALL** questions in **SECTION A, SECTION B, SECTION C and SECTION D**. The distribution of the marks for each question is given.
3. Please write all your answers in the answer box associated with each question in this question paper.
4. Only conventional calculators can be used. Other devices with calculator capabilities (such as smartphone) are not allowed.

Section A

Fill in each blank with ONE word that best fits the meaning of the sentence as a whole.

(10 marks)

Answer

Requirements engineering is a (1. __), iterative,

1)

and incremental process which aims at ensuring that:

(i) all relevant requirements are explicitly known and

(2. __) at the required level of detail, (ii) a

2)

sufficient (3. __) about the system requirements is

3)

achieved between the stakeholders involved and (iii)

all requirements are (4. __) and specified in

4)

(5. __) with the relevant specification formats and

5)

rules. Each requirements engineering process starts

with an aim to (6. __) the current reality. The three

6)

core requirements engineering activities are

performed iteratively in order to establish the

(7. __) within the existing context. These activities

7)

Continued...

are elicitation, documentation, and (8. ____). Besides

8)

that, two cross-sectional activities of (9. ____) and

9)

(10. ____) support the core activities and secure the

10)

results of requirements engineering.

Section B

Read the Scenario 1 and identify the choice that best completes the statement or answers the question.

Scenario 1: ABC consulting firm employs you to conduct an interview. The goal of the interview is to refine the vision "accident-free driving". For this purpose, the intentions and ideas of the interviewees regarding the vision shall be elicited. The result of the interview shall be a set of goals that refine the vision.

(10 marks)
Answer

- 1) What is an unstructured interview?
 - A. The interviewer freely asks broad questions and allows the interviewee to lead the conversation in a direction at his/her own discretion.
 - B. The interviewer asks the interviewee based on a list of prepared questions concerning an issue of interest.
 - C. The interviewer reads a document from a previously defined perspective.
 - D. The interviewer elicits requirements by observing stakeholders or existing systems.

- 2) The following checklist items should be considered in the preparation phase of an interview EXCEPT
 - A. Choose the participants based on the goal of the interview.
 - B. Choose a location that provides an undisturbed environment.
 - C. Learn the terminology of the participants.
 - D. Finalize the interview minutes.

3) The following checklist items should be considered in the execution phase of an interview EXCEPT

- A. Start the interview with an introductory question.
- B. Pay attention to the non-verbal communication of the interviewees.
- C. Distribute the interview results to the interviewees.
- D. Ensure that the elicited information is correct by summing it up for the interviewee and clarifying unclear issues.

4) The following checklist items should be considered in the follow up phase of an interview EXCEPT

- A. Document the elicited requirements.
- B. Communicate the goal and rationale of the interview to the participants.
- C. Ask the interviewees to check and confirm the interview results.
- D. Identify requirements conflicts in the interview results.

5) The following are critical success factors to be considered for applying interview EXCEPT

- A. Communication skills.
- B. Getting to know the interview partners.
- C. No leading questions.
- D. Objectivity of the observer.

Read the Scenario 2 and identify the choice that best completes the statement or answers the question.

Scenario 2: After the completion of interview session, the ABC consulting firm assigns you to a new project. The project manager gives you a requirements specification for a house information system. The following requirements are listed in the specification.

- R1 The system must be developed using the Rational Unified Process.
- R2 The house information system shall generate a monthly report containing all granted and denied admittances to the house.
- R3 If the PIN (personal identification number) the user enters at the keypad is correct, the system shall open the door and record the granted access.
- R4 The system shall be available on the market by 1 May 2016.
- R5 The unlocking of the door shall happen within 0.8s after the PIN has been entered correctly.

Continued...

6) Which of the following are functional requirements?

- A. R1 and R2.
- B. R2 and R3.
- C. R3 and R4.
- D. R4 and R5.

7) Which of the following are constraints?

- A. R1 and R2.
- B. R1, R2 and R3.
- C. R1 and R4.
- D. R1, R4 and R5.

8) What is a quality requirement?

- A. A quality requirement defines a quality property of the entire system or of a system component, service or function.
- B. A quality requirement is an organizational or technological requirement that restricts the way in which the system shall be developed.
- C. A quality requirement is an underspecified functional requirement.
- D. A quality requirement is a documented requirement.

9) Identify the requirement type for R5.

- A. Constraint requirement.
- B. Functional requirement.
- C. Non-functional requirement.
- D. Quality requirement.

10) The following are techniques for reducing the ambiguity of natural language requirements EXCEPT

- A. AND/OR tree.
- B. Controlled languages.
- C. Glossaries.
- D. Syntactic requirements patterns.

Section C

1) Due to resource constraints and limitations, you are asked to perform Wiegers' prioritization matrix for the MMU Online System. The MMU stakeholders agreed and assigned the weights for benefit, penalty, cost and risk as shown in Table 1. In addition, they listed out 10 requirements and estimated the relative benefit, relative penalty, relative cost and relative risk for each requirement. Additional columns (such as Value%, Cost%, Risk% and Priority) are provided for you to jot down the calculated value or you may leave it blank.

Table 1: Prioritization Matrix for the MMU Online System

| Relative Weight | 2 (weight benefit) | 1 (weight penalty) | | | 1 (weight cost) | | 0.5 (weight risk) | | |
|-----------------|--------------------|--------------------|-------------|---------|-----------------|-------|-------------------|--------|----------|
| Requirement | Relative Benefit | Relative Penalty | Total value | Value % | Relative Cost | Cost% | Relative Risk | Risk % | Priority |
| R1 | 7 | 4 | | | 9 | | 7 | | |
| R2 | 9 | 7 | | | 5 | | 3 | | |
| R3 | 9 | 8 | | | 7 | | 8 | | |
| R4 | 4 | 3 | | | 3 | | 2 | | |
| R5 | 2 | 1 | | | 1 | | 1 | | |
| R6 | 4 | 9 | | | 4 | | 4 | | |
| R7 | 6 | 2 | | | 4 | | 3 | | |
| R8 | 5 | 5 | | | 3 | | 2 | | |
| R9 | 3 | 4 | | | 4 | | 2 | | |
| R10 | 5 | 3 | | | 2 | | 1 | | |
| Total | | | | | | | | | |

Based on the given value in Table 1, determine the rank order for each requirement.

(5 marks)

| Requirements | Answer (Rank) |
|--------------|---------------|
| R1 | |
| R2 | |
| R3 | |
| R4 | |
| R5 | |
| R6 | |
| R7 | |
| R8 | |
| R9 | |
| R10 | |

Continued...

2) Inspection is one of the common validation techniques. Differentiate between reader and inspector in an inspection.

(2 marks)

Answer

3) Suggest THREE useful data related to defect especially for documenting inspection results.

(3 marks)

Answer

Section D

1) Draw a class diagram for the following:

The abstract class "requirements artefact" is a generalization of the artefact types "goal", "scenario" and "solution-oriented requirement". A scenario exemplifies the satisfaction of one or multiple goals, and the satisfaction of a goal is exemplified by one of multiple scenarios. In addition, from a scenario, one or multiple solution-oriented requirements can be derived and conversely, each solution-oriented requirement shall be associated with one or multiple scenarios. Furthermore, a goal can be assigned to an arbitrary number of solution-oriented requirements that contribute to the realization of this goal but do not have to be assigned to one. In contrast, each solution-oriented requirement must be associated with at least one goal.

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| Answer | (10 marks) |
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